Wolverine

(*Gulo gulo*)

State Status: Candidate, 1998
Federal Status: Candidate, 2010
Recovery Plans: None

Figure 1. Wolverine captured in northern Cascades, Washington, 2012 (*photo by Scott Fitkin, WDFW*).

The wolverine is a carnivore that occupies arctic, alpine and subalpine habitats in the northern portions of the northern hemisphere (Copeland et al. 2010). It is the largest terrestrial member of the weasel family (Mustelidae), with females weighing 18-27 lbs (8-12 kg) and males weighing 26-44 lbs (12-20 kg) (Pasitschniak-Arts and Lariviere 1995, Copeland and Whitman 2003). Wolverines are stocky with short, rounded ears, small eyes, a bushy tail and large feet that are useful for traversing snow (Figure 1). Their fur is dark brown, but has tawny colored bands that run down both sides of its body to its tail. The wolverine is among the most elusive of North America's carnivores because it avoids people and developed areas, and prefers cold and remote mountainous areas. They seem to be specialists at exploiting a cold, unproductive niche that limits competition from other carnivores (Inman et al. 2012a). Wolverine home ranges in the Greater Yellowstone Ecosystem averaged 303 km^2 for 8 females and 797 km^2 for 5 males, and both sexes moved a distance greater than the circumference of their home range per week (Inman et al. 2012b).

In Washington, the wolverine historically occurred in the alpine and subalpine habitats of the Cascades, Blue Mountains, and Rocky Mountains. Ongoing research projects and recent carnivore surveys have detected wolverines in or near each of these areas of Washington. Wolverines did not historically occur on the Olympic Peninsula or in southwest Washington. In 2009 and 2010, wolverines were photographed at seven detection stations deployed near Mt. Adams in the southern Washington Cascades. While it could not be determined if these detections accounted for more than 1 individual wolverine, they do confirm the continued existence of wolverines in the southern Cascades.

In 2010, the U.S. Fish and Wildlife Service concluded that listing the wolverine as a threatened or endangered species was warranted, based largely on the threat to the species' continued existence in much of the southern portion of its range due to climate change (USFWS 2010). The environmental niche of the wolverine appears to be defined by areas with persistent spring snow cover, which Copeland et al. (2010) suggested was related to the thermal advantages rendered by snow for denning, and thermal intolerance of high summer temperatures. Inman et al. (2012a) suggested a "refrigeration-zone" hypothesis that related wolverine distribution to the ability to cache food, such as winter-killed ungulates, in cold microsites. McKelvey et al. (2012) predicted from climate modeling that wolverine habitat would decline in extent but persist throughout most of the species range at least through the first half of the 21st century; populations would likely become smaller and more isolated.

Figure 2. Female wolverine exiting den in the North Cascades *(photo WDFW).*

Since 2006, researchers with the U.S. Forest Service, WDFW,

and British Columbia Ministry of Environment have studied wolverines in the Cascades of northern Washington and southern British Columbia to learn more about their status, distribution, and general ecology in this region. Given their dependence on cold, snowy environments, wolverines are an indicator species for climate change, making the data from this initial study even more valuable. From 2006 to 2011, researchers captured 9 wolverines (7F, 2M) and fitted 7 with satellite collars in an effort to locate natal dens and gather data on movements. The wolverines moved extensively, established large home ranges, and some made long distance dispersal movements.

During 2012, biologists captured one new male wolverine and recaptured 3 study animals, including two adult females. Telemetry helped pinpoint the natal dens of the two females, the first documented in the Pacific states. Remote cameras documented kit production and den visitation by the resident dominant male (presumed father). Researchers returned to the den during snow-free conditions to gather DNA samples and document den characteristics. Both sites were located in remote subalpine locations holding deep snow late into spring. One occurred in a space between very large boulders, and the other in a log pile at the toe of an avalanche chute (Figure 3).

Figure 3. Wolverine dens, found in Washington's North Cascades with the aid of telemetry in 2012, were in a space under boulders (lower right) and in a log pile in an avalanche chute (left and upper right; *photos by Scott Fitkin, Jeff Heinlen WDFW*).

U.S. Forest Service and WDFW researchers plan to continue trapping and remote camera surveys in 2013, and hope to collar up to 6 wolverines in Washington with satellite/VHF collars. Ministry of Environment biologists in British Columbia and Conservation Northwest volunteers will continue to collaborate on remote camera work.

In 2012, Conservation Northwest's volunteer camera crew obtained remote camera photos of 3 new wolverines in the Steven's Pass area south of the capture study area. In addition, the Carnivore Connectivity Project/Western Transportation Institute obtained remote camera photos in August of an

uncollared wolverine west of the Cascades crest near Glacier Peak Wilderness.

Partners and cooperators: U.S. Forest Service-PNW Research Station, Okanogan-Wenatchee National Forest, British Columbia, Ministry of Environment, Western Transportation Institute, University of California- Davis, Conservation Northwest, North Cascades National Park, U.S. Fish and Wildlife Service.

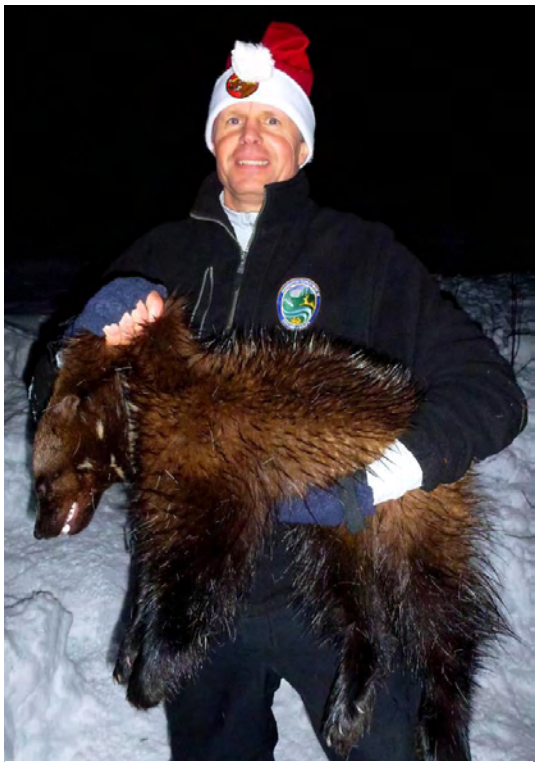

Figure 4. WDFW District Biologist Scott Fitkin with a male wolverine captured in the North Cascades of Okanogan County, Washington, in 2012 *(photo WDFW)*.

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